DETAILED ACTION

Status of Claims

Currently, claims 12-16, 18, and 19 are pending and presented for examination on the merits.

Claim Rejections - 35 USC § 112, First Paragraph

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 15 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claim recites a Mn range of "about 2 to 3.83%." There is no support for the endpoint 3.83% in the original specification as filed. Steel number 2 of Table 14A, as suggested by page 4 of the remarks, has been reviewed for support, but the Mn content is 3.66%, not 3.83% as claimed.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Espy (US 3,736,131).

Regarding claim 15, Espy discloses a dual-phase austenitic-ferritic steel comprising the following elements (abstract; col. 2, lines 6-24):

Element	Claim 15	Espy
C	about 0.2 or less	up to about 0.06
Si	0.4 or less	up to 1.0 maximum
Mn	about 2 - 3.83	about 4 to less than 11.0
P	about 0.1 or less	impurity (see Table I)
S	about 0.03 or less	impurity (see Table I)
Cr	about 15 - about 35	about 19 to about 24
Ni	about 1 or less	up to about 3
N	about 0.05 - about 0.6	about 0.12 to about 0.26
V	not claimed	silent
Fe + impurities	balance	balance

The austenite fraction generally ranges from 10 to 50% with the balance a ferrite matrix (col. 1, lines 9-14). Espy shows that steels having elongations of 48% or close to 48% can be obtained (Table IX), which lies within the claimed range. It is noted that the claimed Mn upper bound of 3.83 does not lie unambiguously within Espy's range of "about 4 to less than 11.0 percent." However, the lower bound of “about 4” encompasses values that approximate 4% or lie slightly above and below 4%. The value 3.83% appears to approximate 4%, as their percent difference is only 4. Thus, Espy’s lower bound of Mn overlaps the claimed upper bound. Given the substantially similar compositions between the claims and prior art, one of ordinary skill in the art would expect steels that lie within ranges common to Espy and the claims and to possess an elongation of 48% or larger when measured under the conditions of the

present specification (MPEP § 2112.01). The overlap between the ranges taught in the prior art and recited in the claims creates a *prima facie* case of obviousness (MPEP § 2144.05).

Espy is silent as to the amount of C+N in the austenite phase. Espy does not disclose whether the Md(γ) of the claimed equation is satisfied. However, it is well established that when a material is produced by a process that is identical or substantially identical to that of the claims and/or possesses a structure or composition that is identical or substantially identical to that of the claims, any claimed properties or functions are presumed to be inherent (MPEP § 2112.01). With respect to the C+N amount, the prior art discloses a critical manufacturing step that is identical to that disclosed by the instant invention. The instant specification discloses that the amount of C+N in the austenite phase is controlled by the chemical composition of the steel as well as the annealing conditions (paragraph [0051]). It is noted that Espy teaches an annealing step that is carried out at 788°C for 4 hours (Table II caption), which lies within the preferred ranges of the instant specification (paragraph [0080]). With respect to the Md(γ) value, the instant specification states that the amount of manganese adjusts the Md(γ) value. Espy teaches an amount of manganese that approximates the claimed range. Thus, one of ordinary skill in the art would have expected the C+N amount and the Md(γ) value to have been satisfied by the steels of Espy in light of the overlapping annealing and compositional parameters.

Regarding claim 16, Espy teaches that molybdenum and copper may be present in amounts of up to 5% and up to 0.5%, respectively (col. 2, lines 18-24).

5. Claim 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Espy, as applied to claim 15 above, and further in view of Maehara et al. (US 4,721,600).

Regarding claims 18 and 19, Espy does not teach the inclusion of aluminum, calcium, magnesium, and rare earth metals. Maehara et al. teach that the addition of up to 0.1% Al and small amounts of Ca, Mg, and REM (small amounts being interpreted as impurity level) helps to deoxidize the duplex stainless steel (col. 11, lines 17-24). It would have been obvious to one of ordinary skill in the art to have added Al, Ca, Mg, and REM to the stainless steel of Espy for the purpose of deoxidizing the steel, thereby preventing the formation of harmful voids.

6. Claims 14, 16, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Espy in view of Maehara et al., with evidence from Holt ("Uniaxial Tension Testing," *ASM Handbook*, Vol. 8, pp. 124-142).

Regarding claim 14, Espy discloses a dual-phase austenitic-ferritic steel comprising the following elements (abstract; col. 2, lines 6-24):

Element	Claim 14	Espy (Heat No. P)	Espy
C	about 0.2 or less	0.008	up to about 0.06
Si	about 1.2 or less	0.40	up to 1.0 maximum
Mn	4.10 - about 12	8.77	about 4 to less than 11.0
P	about 0.1 or less	0.009	impurity (see Table I)
S	about 0.03 or less	0.008	impurity (see Table I)
Cr	about 15 - about 35	20.93	about 19 to about 24
Ni	about 1 or less	0.20	up to about 3
N	about 0.05 - about 0.6	0.25	about 0.12 to about 0.26
V	0.005 - 0.5	silent	silent

Fe + impurities	balance	balance	balance

The austenite fraction generally ranges from 10 to 50%, with Heat No. P specifically containing 38% austenite in the annealed condition (Table II, Heat No. P). Espy teaches that the elongation of the steel is 47% (TABLE IX, Heat No. P, annealed condition). It is acknowledged that this value does not overlap the claimed range. However, it is well known to one of ordinary skill in the metallurgical arts that the value obtained from measuring percent elongation varies depending on the starting length of the tensile specimen; the shorter the gauge length of the original tensile specimen, the larger the percent elongation calculated (Holt, p. 131, Fig. 14). Given the substantially identical compositions between the claims and prior art, one of ordinary skill in the art would expect the steel of Espy to possess a ductility value of 48% or larger when measured under the conditions of the present specification (MPEP § 2112.01).

Espy is silent as to the amount of C+N in the austenite phase. Espy does not disclose whether the Md(γ) of the claimed equation is satisfied. However, it is well established that when a material is produced by a process that is identical or substantially identical to that of the claims and/or possesses a structure or composition that is identical or substantially identical to that of the claims, any claimed properties or functions are presumed to be inherent (MPEP § 2112.01). With respect to the C+N amount, the prior art discloses a critical manufacturing step that is substantially identical to that disclosed by the instant invention. The instant specification discloses that the amount of C+N in the austenite phase is controlled by the chemical composition of the steel as well as the annealing conditions (paragraph [0051]). It is noted that Espy

teaches an annealing step that is carried out at 788°C for 4 hours (Table II caption), which lies within the preferred ranges of the instant specification (paragraph [0080]). With respect to the Md(γ) value, the instant specification states that the amount of manganese adjusts the Md(γ) value. Espy teaches an amount of manganese that overlaps the claimed range. Thus, one of ordinary skill in the art would have expected the C+N amount and the Md(γ) value to have been satisfied by the steels of Espy in light of the overlapping annealing and compositional parameters.

Espy does not teach the inclusion of vanadium. Maehara et al. teach that the addition of 0.01-5.0% V to duplex stainless steels further enhances their corrosion resistance (col. 11, lines 7-11). Therefore, it would have been obvious to one of ordinary skill in the art to have added V to the stainless steel of Espy for the purpose of increasing its ability to resist corrosion.

Regarding claim 16, Espy teaches that Cu may be present in a maximum amount of 0.5% and Mo may substitute Cr in amounts of up to 5% (col. 2, lines 18-24).

Regarding claims 18 and 19, Espy does not teach the inclusion of aluminum, calcium, magnesium, and rare earth metals. Maehara et al. teach that the addition of up to 0.1% Al and small amounts of Ca, Mg, and REM (small amounts being interpreted as impurity level) helps to deoxidize the duplex stainless steel (col. 11, lines 17-21). Therefore, it would have been obvious to one of ordinary skill in the art to have added Al, Ca, Mg, and REM to the stainless steel of Espy for the purpose of deoxidizing the steel, thereby preventing the formation of voids.

7. Claims 12, 13, 15, 16, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hauser et al. (US 6,096,441).

Regarding claims 12, 13, and 15, Hauser et al. disclose an austenoferritic stainless steel that includes the following elements, in percent by weight (abstract; cols. 6-7):

Element	Claim 12	Claim 15	Hauser
C	about 0.2 or less	about 0.2 or less	not exceed 0.04
Si	about 4 or less	0.4 or less	greater than 0.4 to 1.2
Mn	3.01 or less	about 2 - 3.83	2 - 4
P	about 0.1 or less	about 0.1 or less	less than 0.1
S	about 0.03 or less	about 0.03 or less	0.030 or less
Cr	about 15 - about 35	about 15 - about 35	18 - 22
Ni	1 - about 3	about 1 or less	1 or less
N	about 0.05 - about 0.6	about 0.05 - about 0.6	up to 0.3
V	not claimed	not claimed	silent
Fe + impurities	balance	balance	balance

Element	Claim 13	Hauser
C	0.05 or less	not exceed 0.04
Si	about 1.2 or less	greater than 0.4 to 1.2
Mn	1.91 or less	2 - 4
P	about 0.1 or less	less than 0.1
S	about 0.03 or less	0.030 or less
Cr	about 15 - about 35	18 - 22
Ni	0.9 or less	1 or less
N	about 0.05 - about 0.6	up to 0.3
V	not claimed	silent
Fe + impurities	balance	balance

The microstructure is 30-70% austenite (abstract; col. 2, lines 18-21). The elongation is greater than 35% (col. 3, lines 59-62).

With respect to claim 15 and Si, it is noted that the claimed Si upper bound of 0.4 does not overlap the prior art's range of "greater than 0.4 to 1.2." However, it has been held that a *prima facie* case of obviousness may exist even when the claimed and prior

ranges do not overlap, provided that one of ordinary skill in the art would expect the alloys to possess the same properties. See MPEP § 2144.05(I). In the present instance, one of ordinary skill would expect an alloy containing 0.398% Si, within the claimed range for example, to possess the same properties as a steel containing 0.401% Si, within the prior art range for example, because the difference between the two values could be attributed to a percent error in measurement that would result in a negligible difference in alloy properties. Thus, there would appear to be no difference between the ranges absent evidence to the contrary.

With respect to claim 13 and Mn content, it is noted that the claimed Mn upper bound of 1.91 does not overlap the prior art range of 2-4. However, the prior art lower bound of value of 2 appears to approximate claimed upper bound of 1.91, as their percent difference is less than 5%. Thus, Hauser's lower bound of Mn is not patentably distinct from the claimed upper bound. See MPEP § 2144.05(I).

Hauser et al. are silent as to the amount of C+N in the austenite phase. Hauser et al. do not disclose whether the Md(γ) of the claimed equation is satisfied. However, it is well established that when a material is produced by a process that is identical or substantially identical to that of the claims and/or possesses a structure or composition that is identical or substantially identical to that of the claims, any claimed properties or functions are presumed to be inherent (MPEP § 2112.01). With respect to the C+N amount, the prior art discloses a critical manufacturing step that is identical to that disclosed by the instant invention. The instant specification discloses that the amount of C+N in the austenite phase is controlled by the chemical composition of the steel as

well as the annealing conditions (paragraph [0051]). It is noted that Hauser et al. teach an annealing step that is carried out at 1040°C for one minute (col. 3, lines 39-41), which lies within the preferred ranges of the instant specification (paragraph [0080]). With respect to the Md(γ) value, the instant specification states that the amount of manganese adjusts the Md(γ) value. Hauser et al. teach an amount of manganese that overlaps the claimed range. Thus, one of ordinary skill in the art would have expected the C+N amount and the Md(γ) value to have been satisfied by the steels of Hauser et al. in light of the overlapping annealing and compositional parameters.

Regarding claim 16, Hauser et al. teach that molybdenum and copper are present in amounts of up to 3% and 0.05-4%, respectively (abstract; col. 8, lines 5, 10).

Regarding claim 18, Hauser et al. teach aluminum in an amount of 0.010-0.030% (col. 8, lines 24-26).

Regarding claim 19, Hauser et al. teach that calcium and boron are present in amounts of 0.0005-0.0020% and 0.0005-0.0030%, respectively (col. 8, lines 27-32).

8. Claims 14, 16, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hauser et al. in view of Maehara et al.

Regarding claim 14, Hauser et al. disclose an austenoferritic stainless steel that includes the following elements, in percent by weight (abstract; cols. 6-7):

Element	Claim 14	Hauser
C	about 0.2 or less	not exceed 0.04
Si	about 1.2 or less	greater than 0.4 to 1.2
Mn	4.10 - about 12	2 - 4
P	about 0.1 or less	less than 0.1
S	about 0.03 or less	0.030 or less

Cr	about 15 - about 35	18 - 22
Ni	about 1 or less	1 or less
N	about 0.05 - about 0.6	up to 0.3
V	0.005 - 0.5	silent
Fe + impurities	balance	balance

The microstructure is 30-70% austenite (abstract; col. 2, lines 18-21). The elongation is greater than 35% (col. 3, lines 59-62).

With respect to claim 14 and Mn content, it is noted that the claimed Mn lower bound of 4.10 does not overlap the prior art range of 2-4. However, the prior art upper bound of value of 4 appears to approximate claimed lower bound of 4.10, as their percent difference is less than 3%. Thus, Hauser's lower bound of Mn is not patentably distinct from the claimed upper bound. See MPEP § 2144.05(I).

Hauser et al. are silent as to the amount of C+N in the austenite phase. Hauser et al. do not disclose whether the Md(γ) of the claimed equation is satisfied. However, it is well established that when a material is produced by a process that is identical or substantially identical to that of the claims and/or possesses a structure or composition that is identical or substantially identical to that of the claims, any claimed properties or functions are presumed to be inherent (MPEP § 2112.01). With respect to the C+N amount, the prior art discloses a critical manufacturing step that is identical to that disclosed by the instant invention. The instant specification discloses that the amount of C+N in the austenite phase is controlled by the chemical composition of the steel as well as the annealing conditions (paragraph [0051]). It is noted that Hauser et al. teach an annealing step that is carried out at 1040°C for one minute (col. 3, lines 39-41), which lies within the preferred ranges of the instant specification (paragraph [0080]).

With respect to the Md(γ) value, the instant specification states that the amount of manganese adjusts the Md(γ) value. Hauser et al. teach an amount of manganese that overlaps the claimed range. Thus, one of ordinary skill in the art would have expected the C+N amount and the Md(γ) value to have been satisfied by the steels of Hauser et al. in light of the overlapping annealing and compositional parameters.

Hauser et al. do not teach the inclusion of vanadium. Maehara et al. teach that the addition of 0.01-5.0% V to duplex stainless steels further enhances their corrosion resistance (col. 11, lines 7-11). Therefore, it would have been obvious to one of ordinary skill in the art to have added V to the stainless steel of Hauser et al. for the purpose of increasing its ability to resist corrosion.

Regarding claim 16, Hauser et al. teach that molybdenum and copper are present in amounts of up to 3% and 0.05-4%, respectively (abstract; col. 8, lines 5, 10).

Regarding claim 18, Hauser et al. teach aluminum in an amount of 0.010-0.030% (col. 8, lines 24-26).

Regarding claim 19, Hauser et al. teach that calcium and boron are present in amounts of 0.0005-0.0020% and 0.0005-0.0030%, respectively (col. 8, lines 27-32).

9. Claims 12, 16, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Magee, Jr. et al. (US 5,254,184, hereinafter, "Magee et al.").

Regarding claim 12, Magee et al. teach a duplex stainless steel that includes the following elements in percent by weight (abstract; col. 2, lines 48-53):

Element	Claim 12	Magee, Jr. et al.
C	about 0.2 or less	0.1 max.
Si	about 4 or less	2.5 - 6
Mn	3.01 or less	0 - 6
P	about 0.1 or less	up to about 0.06
S	about 0.03 or less	up to about 0.03
Cr	about 15 - about 35	16 - 24
Ni	1 - about 3	2 - 12
N	about 0.05 - about 0.6	0.07 - 0.30
V	not claimed	not more than about 0.2
Fe + impurities	balance	balance

The duplex steel contains 15-50 vol.% ferrite, the balance austenite (abstract; col. 2, lines 22-23; col. 5, lines 7-19). The overlap between the ranges taught in the prior art and recited in the claims creates a *prima facie* case of obviousness (MPEP § 2144.05).

Magee et al. are silent as to the percent elongation and amount of C+N in the austenite phase. Magee et al. do not disclose whether the Md(γ) of the claimed equation is satisfied. However, it is well established that when a material is produced by a process that is identical or substantially identical to that of the claims and/or possesses a structure or composition that is identical or substantially identical to that of the claims, any claimed properties or functions are presumed to be inherent (MPEP § 2112.01). With respect to the C+N amount, the prior art discloses a critical manufacturing step that is identical to that disclosed by the instant invention. The instant specification discloses that the amount of C+N in the austenite phase is controlled by the chemical composition of the steel as well as the annealing conditions (paragraph [0051]). It is noted that Magee et al. teach an annealing step that is carried out at 1066°C for one hour (col. 6, lines 51-53), which lies within the preferred ranges of the instant specification (paragraph [0080]). With respect to the Md(γ) value, the instant

specification states that the amount of manganese adjusts the Md(γ) value. Hauser et al. teach an amount of manganese that overlaps the claimed range. Thus, one of ordinary skill in the art would have expected the percent elongation, the C+N amount, and the Md(γ) value to have been satisfied by the steels of Magee et al. in light of the overlapping annealing and compositional parameters.

Regarding claim 16, Magee et al. teach that there may be a maximum of 4.0% (abstract; col. 2), and Cu may be present in an amount of up to 3.0% (col. 4, lines 62-67), which overlap and lie within the claimed ranges, respectively.

Regarding claim 18, Magee et al. teach that the steel may contain up to about 0.025% Al (col. 4, lines 51-55), which overlaps the claimed range.

Regarding claim 19, Magee et al. teach that the steel may contain B (about 0.001-0.005%), Ca or Mg (up to about 0.010%), misch metal (up to about 0.02%), and Ti (up to about 0.2%) (col. 4, lines 47-62), which overlap the claimed ranges.

10. Claims 12, 13, 15, 16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuzaki et al. (JP 10-219407, English abstract and computer-generated translation).

Regarding claims 12, 13, and 15, Matsuzaki et al. teach stainless steel alloys containing the following elements in percent by mass (abstract; paragraphs [0008]-[0014]):

Element	Claim 12	Claim 13	Matsuzaki et al.
C	about 0.2 or less	0.05 or less	0.10 or less
Si	about 4 or less	about 1.2 or less	1.0 or less
Mn	3.01 or less	1.91 or less	1.5 or less

P	about 0.1 or less	about 0.1 or less	impurity
S	about 0.03 or less	about 0.03 or less	impurity
Cr	about 15 - about 35	about 15 - about 35	16 - 25
Ni	1 - about 3	0.9 or less	3.0 or less
N	about 0.05 - about 0.6	about 0.05 - about 0.6	0.020 - 0.070
V	not claimed	not claimed	silent
Fe + impurities	balance	balance	balance

Element	Claim 15	Matsuzaki et al.
C	about 0.2 or less	0.10 or less
Si	0.4 or less	1.0 or less
Mn	about 2 - 3.83	1.5 or less
P	about 0.1 or less	impurity
S	about 0.03 or less	impurity
Cr	about 15 - about 35	16 - 25
Ni	about 1 or less	3.0 or less
N	about 0.05 - about 0.6	0.020 - 0.070
V	not claimed	silent
Fe + impurities	balance	balance

Austenite is present in an amount of 5-20% (paragraph [0018]). The elongation is greater than 30% (abstract; paragraph [0004]). The overlap between the ranges taught in the prior art and recited in the claims creates a *prima facie* case of obviousness (MPEP § 2144.05).

Matsuzaki et al. are silent as to the percent elongation and amount of C+N in the austenite phase. Matsuzaki et al. do not disclose whether the Md(γ) of the claimed equation is satisfied. However, it is well established that when a material is produced by a process that is identical or substantially identical to that of the claims and/or possesses a structure or composition that is identical or substantially identical to that of the claims, any claimed properties or functions are presumed to be inherent (MPEP § 2112.01). With respect to the C+N amount, the prior art discloses a critical manufacturing step that is identical to that disclosed by the instant invention. The

instant specification discloses that the amount of C+N in the austenite phase is controlled by the chemical composition of the steel as well as the annealing conditions (paragraph [0051]). It is noted that Matsuzaki et al. teach an annealing step that is carried out at 1080°C, for example (Table 2, Steel No. 1), which lies within the preferred ranges of the instant specification (paragraph [0080]). With respect to the Md(γ) value, the instant specification states that the amount of manganese adjusts the Md(γ) value. Matsuzaki et al. teach an amount of manganese that overlaps the claimed range. Thus, one of ordinary skill in the art would have expected the C+N amount and the Md(γ) value to have been satisfied by the steels of Matsuzaki et al. in light of the overlapping annealing and compositional parameters.

Regarding claim 16, Matsuzaki et al. teach the addition of up to 1.0% Cu and up to 1.0% Mo (paragraphs [0013]-[0014]).

Regarding claim 18, Matsuzaki et al. teach the addition of up to 1.0% Al (paragraph [0014]).

11. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuzaki et al., as applied to claim 12, 13, or 15 above, and further in view of Maehara et al.

Regarding claim 19, Matsuzaki et al. do not teach the inclusion of calcium, magnesium, and rare earth metals. Maehara et al. teach that the addition of up to 0.1% Al and small amounts of Ca, Mg, and REM (small amounts being interpreted as impurity level) helps to deoxidize the duplex stainless steel (col. 11, lines 17-24). It would have

been obvious to one of ordinary skill in the art to have added Ca, Mg, and REM to the stainless steel of Matsuzaki et al. for the purpose of deoxidizing the steel, thereby preventing the formation of harmful voids.

Response to Arguments

Applicant's arguments with respect to Espy as applied to claim 12 have been considered but are moot, as Espy is no longer relied upon to reject claim 12.

Applicant states that the objectives of Espy are not the same as that of the instant invention. In response, whether the objectives of the prior art are different from those of the instant invention are immaterial. As long as the claimed structure is disclosed or is obvious from the prior art, the claim limitations are satisfied.

With respect to Espy as applied to claims 15 and 16, Applicant argues that the Espy's Mn range of 4 to less than 11.0 does not render obvious the claimed Mn range of 2-3.83. In response, it is noted that the claimed Mn upper bound of 3.83 does not lie unambiguously within Espy's range of "about 4 to less than 11.0 percent." However, the lower bound of "about 4" encompasses values that approximate 4% or lie slightly above and below 4%. The value 3.83% appears to approximate 4%, as their percent difference is only 4. One of ordinary skill in the art would attribute a 4% percent difference from 4% as being "about" 4%. Thus, Espy's lower bound of Mn at least approximates, if not overlaps, the claimed upper bound. See MPEP § 2144.05(I).

With respect to Espy and Maehara as applied to claims 14, 16, 18, and 19, Applicant argues that the claimed C+N distribution and Md(γ) would not be inherent to

the steel of Espy because Espy's manufacturing process is not identical to that of the instant invention. Applicant specifically points out that the instant steel requires a hot rolling step, an annealing step, a cold rolling step, and a finish annealing step, whereas Espy is silent as to the process of their invention. In response, it should be noted that hot rolling, cold rolling, and annealing are conventional steps in the manufacturing of steel (see, e.g., Hauser et al. at col. 3, lines 34-42). Therefore, it cannot be concluded that Espy does not employ conventional method steps merely because Espy is silent in disclosing those steps.

Applicant states that one of ordinary skill in the art would not turn to Maehara for adding V because Maehara teaches away from adding that element. In response, it has been established that "[p]atents are relevant as prior art for all they contain," including non-preferred or alternative embodiments. See MPEP § 2123. In the present instance, Maehara makes clear that while V may be omitted, it may also be added should the skilled artisan find it necessary (col. 7, lines 16-19; col. 11, lines 7-11). In other words, the addition of V is an alternative embodiment. Thus, Maehara's teaching of the optional addition of V does not teach away from its addition when the feasibility of its addition is taught.

With respect to Hauser and claim 12, Applicant argues that the amount of Ni in Hauser is lower than the claimed range and that one of ordinary skill in the art would not be motivated to increase its amount because Ni is too expensive. In response, the fact that a combination would not be made by businessmen for economic reasons does not mean that a person of ordinary skill in the art would not make the combination because

of some technological incompatibility. *In re Farrenkopf*, 713 F.2d 714, 219 USPQ 1 (Fed. Cir. 1983). See also MPEP § 2145. Additionally, Hauser teaches a limit of 1% (col. 6, lines 55-57), which overlaps with the claimed endpoint of 1.

Applicant argues that Hauser teaches away from the claimed amount of 1.91% Mn. In response, it is noted that the claimed Mn upper bound of 1.91 does not overlap the prior art range of 2-4. However, the prior art lower bound of value of 2 appears to approximate claimed upper bound of 1.91, as their percent difference is less than 5%. Thus, Hauser's lower bound of Mn is not patentably distinct from the claimed upper bound. See MPEP § 2144.05(I).

Applicant argues that Hauser teaches away from the claimed amount of 0.4% Si. In response, it is noted that the claimed Si upper bound of 0.4 does not overlap the prior art's range of "greater than 0.4 to 1.2." However, it has been held that a *prima facie* case of obviousness may exist even when the claimed and prior ranges do not overlap, provided that one of ordinary skill in the art would expect the alloys to possess the same properties. See MPEP § 2144.05(I). In the present instance, one of ordinary skill would expect an alloy containing 0.398% Si, within the claimed range for example, to possess the same properties as a steel containing 0.401% Si, within the prior art range for example, because the difference between the two values could be attributed to a percent error in measurement that would result in a negligible difference in alloy properties. Thus, there would appear to be no difference between the ranges absent evidence to the contrary.

Applicant argues that the claimed Mn amount of 4.10-12% Mn lies outside Hauser's range of 2-4. With respect to claim 14 and Mn content, it is noted that the claimed Mn lower bound of 4.10 does not overlap the prior art range of 2-4. However, the prior art upper bound of value of 4 appears to approximate claimed lower bound of 4.10, as their percent difference is less than 3%. Thus, Hauser's lower bound of Mn is not patentably distinct from the claimed upper bound. See MPEP § 2144.05(I).

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VANESSA LUK whose telephone number is (571)270-3587. The examiner can normally be reached on Monday-Friday 9:30 AM-4:30 PM ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached at 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/VANESSA LUK/
Examiner, Art Unit 1733
/Scott Kastler/
Primary Examiner, Art Unit 1733